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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,599	10/13/2000	Kwang Seop Park	8733.167.00	8223

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MCKENNA LONG & ALDRIDGE LLP
1900 K STREET, NW
WASHINGTON, DC 20006

EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 02/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/689,599

Applicant(s)

PARK ET AL.

Examiner

Prasad R Akkapeddi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☒ Claim(s) 14 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7,8. 6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 19 is objected to because of the following informalities: Replace 'electric constant' with 'dielectric constant'. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 19 recites the limitation "electric constant" in claim 13. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gu et al. (Gu) (U.S. Patent No. 6,359,672).

As to claim 1: Gu discloses a method of fabricating a liquid crystal display device including a thin film transistor (9) gate line (17) and data line (5) on a transparent substrate, forming the organic insulating film (33) on the transparent

substrate to a thickness of between 0.9 to 2.75 micrometers (Col. 8, lines 21).

This range of thickness overlaps the recited feature in the instant claim. Gu also discloses that the pixel electrode (3) (Col. 5, line 46) and the organic insulating film (33) so as to be overlapped by a predetermined area (Fig. 1) with the gate line (Col. 8, lines 49-51). Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to rejections based on the anticipation of ranges. Note that the range for the thickness of the organic insulating film of between 0.9 to 2.75 micrometers as disclosed by Gu overlaps the range of 0.8 and 1.5 microns (as asserted in claim 1). Therefore, the range in claim 1 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the thickness of between 0.8 and 1.5 microns for reducing the potential voltage swings.

a. As to claims 2-6: Gu discloses that the thickness of the organic insulating film is 0.9 micrometers which is less than 1.3 micrometers, and the dielectric constant is about 2.7 (Col. 7, line 37), which is less than 3.0, and the organic insulating film is made from Benzocyclobutene (BCB) (Col. 7, line 26). Gu also discloses that the line-pixel capacitance (also parasitic capacitance C_{pl} , Col. 5, line 52) value in areas of overlap is less than 9.0 fF (Col. 9, lines 1- 5), and the width of an overlapping area at which the pixel electrode is overlapped with the data line (5) is between 2-3 micrometers (Col. 8, lines 52-53) which is greater

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than 1.5 micrometers as recited. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the device Gu discloses to improve the manufacturability and the capacitive cross talk of the device.

b. As to Claims 7-12: Gu discloses a liquid crystal display device (Fig. 1) containing a thin film transistor (9) gate line (17) and data line (5) on a transparent substrate, forming the organic insulating film (33) on the transparent substrate to a thickness of between 0.9 to 2.75 micrometers (Col. 8, lines 21). This range of thickness overlaps the recited feature in the instant claim. Gu also discloses that the pixel electrode (3) (Col. 5, line 46) and the organic insulating film (33) so as to be overlapped by a predetermined area (Fig. 1) with the data line (Col. 8, lines 49-51), and the source electrode (15) is connected to the pixel electrode (3) (Col.6, lines 32-33). Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to rejections based on the anticipation of ranges. Note that the range for the thickness of the organic insulating film between 0.9 to 2.75 microns as disclosed by Gu, overlaps the range of 0.8 and 1.5 microns as asserted in claim 7. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the thickness of the organic insulating film between 0.8 and 1.5 microns for reducing potential voltage swings.

Gu also discloses that the dielectric constant is about 2.7 (Col. 7, line 37), which is less than 3.0, and the organic insulating film is made from

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Benzocyclobutene (BCB) (Col. 7, line 26), the thickness being 0.9 micrometers which is less than 1.3 micrometers. Gu also discloses that the line-pixel capacitance (also parasitic capacitance Cpl, Col. 5, line 52) value in areas of overlap is less than 9.0 fF (Col. 9, lines 1- 5). Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to rejections based on the anticipation of ranges. Note that the range for the parasitic capacitance value as disclosed by Gu overlaps the range of less than 0.0003pF (asserted in claims 12). Therefore, the range in claims 12 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the parasitic capacitance value of less than 0.0003pF and adjusting thickness of the organic insulating film between 1.25 and 1.27 microns (as asserted in claim 11), for reducing the capacitive crosstalk.

As to claims 22 and 23: Gu discloses a liquid crystal display device including a thin film transistor (3) formed at an intersection between a gate line and a data line (Fig. 1), and a pixel electrode (3) connected to a source electrode (15) of the thin film transistor and overlapped with at least one of the gate line (5) and the data line (7) with having an organic insulating film (33) there between, wherein a thickness of the organic insulating film is between 0.9 to 2.75 microns, the dielectric constant of the organic insulating film being 2.7 which is less than 3.0. Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to

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rejections based on the anticipation of ranges. Note that the range for the thickness of the organic insulating film of between 0.9 to 2.75 micrometers as disclosed by Gu overlaps the range of 0.8 and 1.5 microns (as asserted in claim 22). Therefore, the range in claim 22 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the thickness of between 0.8 and 1.5 microns for reducing the potential voltage swings

6. Claim 13, 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gu in view of Yamakazi (U.S. Patent No. 5,463,483).

The recited feature of the relationship between the thickness, the dielectric constant of the organic insulating layer and the signal delay for the gate and data lines was not disclosed by Gu. However, Yamakazi in disclosing a liquid crystal display discloses the dependence of the dielectric constant and the thickness of the insulator on the signal delay (Col. 2, lines 13-34). The recited features in claims 15-21 are already disclosed by Gu as described above. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the thickness and a dielectric constant of the organic insulating film such that a signal delay of less than 10 microseconds as disclosed by Yamakazi to the liquid crystal display device of Gu for stabilizing the potential of the pixel electrode.

Allowable Subject Matter

7. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

8. The following is an examiner's statement of reasons for allowance:

The prior art does not teach or disclose that 'the thickness and the dielectric constant of the organic insulating film are selected such that a liquid crystal pixel cell driven with the pixel electrode charges to a voltage which is more than 95% of a video data voltage within $\frac{1}{2}$ of an enabling interval of a control signal for forming a channel of the thin film transistor'.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Den Boer et al. (U.S. Patent No. 5,641,974): discloses a LCD with bus lines overlapped by pixel electrodes and photo-imageable insulating layer therebetween.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

RRK

January 25, 2003

RRK
SUPERVISOR
TECHNICAL STAFF
JAN 25 2003